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NOTE TO TEACHERS: Because of the Easter recess, there will be no GEOGRAPHIC SCHOOL BULLETINS on April 7. The BULLETINS will be resumed on Monday, April 14.

LUIS MARDEN

COSTA RICA'S KING COFFEE MUST HAVE A TYPICAL NATIVE BEAUTY FOR HIS QUEEN

So high is the percentage of beauty among the girls of Costa Rica (page 3) that even a blind judge could not fail to pick a winner for the part of Coffee Queen (right). It would be hard to choose between this reigning beauty and her lady-in-waiting.

Hard-Working Costa Rica Hit by High Prices

COSTA RICA, one of the most peaceful and prosperous of Latin American countries, is suffering from the postwar ailment that afflicts most of the rest of the world—rising prices. Dissatisfaction with the high living costs, and with the lifting of export regulations on meat and sugar, has led to demonstrations in San José, the capital.

The war increased Costa Rica's importance as source of such tropical products as coffee and cocoa. Coffee is the chief export. The country normally produces more than 50,000,000 pounds a year. Before the war Germany was the largest consumer of Costa Rica coffee, with Britain second. The United States has replaced these countries as Costa Rica's No. 1 customer, and in 1941 bought three-quarters of the coffee crop.

Climate Is Ideal for Experiments in Agriculture

Running from the Caribbean to the Pacific at the point where North America narrows down toward the Isthmus of Panama, Costa Rica lies along the line where the floras of North and South America meet. For this reason its vegetation is more varied than that of any other area of equal size in America, if not in the world. Because of this unusual climatic condition, the Inter-American Institute of Agricultural Sciences was established at Turrialba, near the center of the country. Here scientists from all over America develop new methods in agriculture.

Costa Rica's volcanoes have wrought havoc, but they also have produced the very fertile soil of the central plateau—3,000 to 5,000 feet above sea level—which is especially suited to the growing of coffee.

In 1944 Costa Rica's population was estimated to be 706,596, which is less than that of Boston. The country has an area of 23,000 square miles, not quite as large as that of West Virginia.

Costa Rica's prosperity depends largely upon exports of coffee and bananas. There are more than 1,000,000 acres under cultivation. More than 6,000,000 acres serve as grazing land for hundreds of thousands of cattle. Although there are a number of large banana plantations, most of the farmland is in small holdings. The typical Costa Rica farmer owns his own land, grows vegetables for the family's meals, and is the proud possessor of a "singing" oxcart (illustration, page 4).

Blight Drives Bananas Westward

More than 6,000,000 stems of bananas have been exported in a year. As much as four-fifths of the crop is shipped to the United States. Blight and soil exhaustion along the east coast caused a decline in production, and new plantations have been established on the Pacific coast.

The shift to west-coast banana production brought about the $15,000,000 harbor development at Golfito, near the Panama border. This new seaport is 60 miles south of Puntarenas, Costa Rica's second-largest port, and Pacific terminus of the railway connecting the two oceans.

Costa Rica has refineries to process sugar cane grown on its own plantations. It grows cacao—source of chocolate and cocoa, rice, and coconuts, and a wide variety of temperate-zone vegetables such as corn,

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WILLARD R. CULVER

YOUNG PEOPLE AWAIT THEIR TURNS TO AQUAPLANE ON LAKE HAMILTON, NESTLED AMONG THE OUACHITA SLOPES NEAR HOT SPRINGS, ARKANSAS (page 7)

Dynamite Alters Helgoland Geography

HELGOLAND, whose 200-foot red sandstone cliffs, white sand beaches, and green pastures have long been a vivid landmark for mariners in the North Sea, may lose a few of its familiar contours in the current demolition of German fortifications.

The British, occupying the tiny island near the mouth of the Elbe, are now finishing the job of blowing up all German installations. Dynamite alters geography as huge explosions lift the roofs off corridors and chambers that honeycombed the sandstone base of the flat-topped isle and made it known as the Gibraltar of the North Sea.

World War II Destroyed Anti-erosion Devices

The "walls" of Helgoland have come crumbling down for centuries, but nature has done much of the work. Wind and sea have continually worn back the cliffs encircling the island until an area of less than one square mile is all that is left of an original five square miles. Alarmed Helgolanders, to combat erosion, built protective granite facings on the cliffs, constructed sea walls, bricked down sections of the surface, and even used iron chains to hold the island together.

During World War II terrific bombings by the British destroyed many of these protective devices and again gave nature free rein.

Defying the Versailles Treaty, Germany made Helgoland into a powerful fortress and naval base (illustration, page 6) in preparation for World War II. Buried under tons of concrete, hidden submarine pens sent out packs of U-boats and torpedo boats to harry Allied shipping. Radar equipment spotted Allied planes. Antiaircraft fire and fighter planes rising from the near-by island base of Düne were thrown against Allied airmen heading toward the continent.

Even before World War I, German fortifications, harbor improvements, and facilities for the naval base were estimated to have cost $80,000,000. Although the British fleet won the engagement fought near the island in 1914, the rocky outpost continued to guard the mouths of Germany's Weser, Elbe, and Ems rivers, the important ports of Hamburg and Bremen, and the Kiel Canal link between the North and Baltic seas.

Once Owned by British, Traded for Zanzibar

Helgoland came into German hands in 1890, having been a British possession since it was taken over during the Napoleonic wars to serve as a base for running the continental blockade.

Great Britain's trade of the small North Sea island for the big island of Zanzibar, off the east coast of Africa, brought sharp criticism in Germany, including the witticism that the Germans had received "a single trouser button for a whole suit of clothes."

But the button of Helgoland was not without value, even when it was not officially being used as a military base. It became a popular vacation resort for tens of thousands of Germans from the mainland each year. Its fishing fleet and local activities supplied exports as well as a living for the several thousand prewar inhabitants.

Helgoland long was a refuge for hundreds of species of migratory

potatoes, and beans. It mines half a million dollars' worth of gold annually, and has manganese, quartz, and other mineral deposits.

Costa Rica is largely dependent on other countries for such manufactured goods as fabrics and flour, most of which come from the United States. Timber of rosewood, mahogany, cedar, and other valuable trees covers thousands of square miles. Wild rubber has long been produced, and one United States manufacturer has established a rubber plantation.

Because most of the Indians who were living in the region when the Spaniards came were killed in their struggle with the European invaders, or died of disease or overwork, Costa Rica's population is now chiefly of Spanish stock (illustration, cover). Along the Pacific coast there is a noticeable trace of Indian blood, and on the Caribbean side a mixture of Spanish and Negro resulting from the importation of Negroes to work on the banana plantations.

NOTE: Costa Rica is shown on the National Geographic Society's map of Mexico, Central America, and the West Indies. Write the Society's headquarters, Washington 6, D. C., for a price list of maps.

See also, "Land of the Painted Oxcarts," in the *National Geographic Magazine* for October, 1946; and, in the GEOGRAPHIC SCHOOL BULLETINS, April 12, 1943, "Costa Rica, Where 'Little Landers' Prosper."

LUIS MARDEN

WEDGES OF WOOD FORM THE WHEELS OF COSTA RICA'S FAMOUS SINGING OXCARTS

Wheels of Costa Rica's singing oxcarts were formerly made of one piece of wood. But scarcity of large trees has changed the pattern. Now 16 wedges shaped like stingy pieces of pie are fitted together around a metal hub and bound with an iron tire. Alligator wood is a favorite because it is resonant. Carts are painted different colors in different parts of the country, but they all share one quality—they sing. Each has its own individual song—the play of the wheel on the axle. Costa Ricans often boast that they can tell the approach of a friend by the "voice" of his oxcart.

Hot Springs, Oldest National Playground

THE Hot Springs of Arkansas (illustration, page 8) were a popular resort long before the white man discovered their mineral waters and scenic setting in the Ouachita Mountains. For centuries, according to Indian tradition, warring tribes met and mixed freely in the neutral territory of the springs—to take advantage of the curative waters.

The region was made a national park in 1921. However, in 1832, forty years before the establishment of Yellowstone, the first national park, the springs and four square miles of surrounding territory were set aside by act of Congress for the benefit of the public. This action made Hot Springs the oldest of all such national playgrounds.

Thomas Nuttall, Ornithologist, Explored Springs Area

One purpose of Congress was to prevent the exploitation of the hot springs for private profit. This barrier to the development of the health resort was not removed until 1876, by a decree of the United States Supreme Court. Government regulations still prohibit the bottling and shipment of the water.

The territory had not long belonged to the United States, following the Louisiana Purchase, when President Jefferson sent Dr. George Hunter and the scientist, William Dunbar, to investigate the hot springs. A few years later another scientist, Thomas Nuttall, explored this region. He found the breeding ground for such birds as the twohee, Carolina wren, ovenbird, scarlet tanager, blackbilled cuckoo, and others. A native of England, Nuttall was noted as an ornithologist and botanist.

Wooden troughs were the first crude bathing facilities at Hot Springs, and the first bathhouses were made of logs, equipped with wooden bathtubs. These were provided for early health seekers before the springs came into federal possession. Until 1874, when the first railroad reached the town, visitors to Hot Springs came by stagecoach.

Now this famous spa has 17 bathhouses operating under the rules and regulations laid down by the Department of the Interior. Eight are in the park, nine in the city of Hot Springs. They are all provided with water from the 47 hot springs which supply about a million gallons of water a day, at an average temperature of more than 140 degrees.

Hot Springs Known as Health and Pleasure Resort

The 2,560 acres of the original reservation were later reduced to 1,006 acres. Part of the difference went to form the city of Hot Springs, Arkansas. Operating under its own municipal laws, it owes its existence to the springs, and has built many hotels to accommodate visitors. The largest hotel takes care of more than 1,000 guests, and in all as many as 25,000 visitors can be entertained at one time.

Aside from its interest as a health center, Hot Springs is becoming increasingly a pleasure resort and convention city. It has motion picture houses, and theaters, including summer theaters. Concerts, horse racing, baseball games, and golfing offer their varied attractions.

birds, which in peacetime were studied and banded there. It also was once a pirate base against the rich Hanseatic shipping.

Helgolanders speak the old Frisian dialect and cling to the simple ways of their Teutonic ancestors. In the Dark Ages, Helgoland was the "holy land" of Fosite, an obscure local god of the pagan Frisians. A Christian monk shipwrecked on the island in the 8th century defied the sacred taboos and converted a few of the natives to his own religion. Other missionaries followed, eventually turning the pagan shrine into a Christian center.

NOTE: Helgoland (Helgoländer) may be located on the Society's map of Germany and its Approaches.

See also, "Demolishing Germany's North Sea Ramparts," in the *National Geographic Magazine* for November, 1946.

BRITISH OFFICIAL

HELGOLAND'S DISTINCTIVE CLIFFS, PROTECTED BY A SEA WALL, ARE VISIBLE EVEN FROM FAR UP

Their 200-foot height is foreshortened by the camera's altitude. The cliffs form a Manhattan-shaped triangle following the sea (top) to Sathurn (South Horn, near the head of the basin), cutting sharply back toward the rectangular basin, then following the deep shadow northwestward. The segment between the two basins is the Unterland. A flight of 178 steps ascends to the Oberland, whose main street, the Falm, stretches diagonally along the cliff's edge. The naval base (left) and military area (right) are on made land. Picture was taken just before the RAF bombing attack in April, 1945.

Scientists Depart for Brazil Eclipse

THE National Geographic Society-Army Air Forces Eclipse Expedition officially gets under way this week as 13 scientists from various government and private organizations take off for Brazil.

Dr. Lyman J. Briggs, chairman of the Research Committee of the National Geographic Society, is the scientific leader of the expedition. The weeks between now and May 20—date of the eclipse—will be spent in preparation and rehearsal for the three minutes and forty-eight seconds of totality as the moon passes between the earth and the sun.

Bocayuva Site Offers Likelihood of Clear Skies

Members of the staff of the National Geographic Society and Army Air Forces personnel have been on the spot for three weeks and more—preparing a camp in the Brazilian interior for the use of at least 73 persons. Campsite is six miles south of Bocayuva, a hamlet high in the rolling country of Minas Geraes, 400 miles north of Rio de Janeiro.

This site was selected because study showed that it offered the greatest likelihood of clear skies at eclipse time. A landing strip was built on which have been landed all supplies—including 16 tons of food, 25 tons of Army equipment, and 10 tons of scientific apparatus.

This is the seventh total eclipse the Society has studied. The last one was observed from Canton Island, in mid-Pacific, in 1937 (illustration, page 10). Lines of study begun during former eclipses will be continued, and new objectives will be sought, in this year's observation. This will be the first eclipse to be televised. Also, on-the-spot broadcasts will describe it to the world.

Eclipses are not studied simply to obtain pictures of the moon covering the sun, though that is an important objective. The celestial phenomenon offers a fine opportunity to check whether the solar system is running on time and whether our timekeeping system is accurate.

Tests Will Prove Validity of Einstein Theory

Among other scientific problems to be probed will be Einstein's Theory of Relativity. Its strange concept that space is curved will be tested by photographing certain stars that will be visible near the sun during the eclipse. Ordinarily these stars are invisible because the sun's glare drowns them out.

If the Einstein Theory is correct, the light rays coming from these stars will be slightly bent by the gravitational pull of the sun as they pass by it. If this happens, the images of the stars on the photographic plates will be slightly shifted from their actual positions.

As a check on how much the star images are misplaced, other pictures will be taken of the same stars six months later from the same spot. At that time the sun will not be present to bend the stars' rays.

Possible effect of an eclipse on the mysterious cosmic rays which constantly bombard the earth from outer space will be studied from the B-29 "flying laboratory" and by radiosonde balloons. A B-17 bomber flying at 30,000 feet will take pictures of the eclipse and will attempt to photograph the moon's shadow racing along the earth's surface.

The pine-covered mountains, rising to 1,200 feet and over, and the scenic Ouachita River Valley early made this area a popular summer vacation ground. With the development of hotels, it became even more popular as a winter resort because of its equable climate.

In Hot Springs National Park and near-by Ouachita National Forest, foot trails, bridle paths, and scenic mountain drives are available to visitors. Water sports and fishing are to be had on near-by Lake Hamilton (illustration, page 2) and Lake Catherine. The lakes are the result of hydroelectric power dams on the Ouachita (pronounced WASH-ih-taw) River. Streams in the area provide fly fishing.

Because of the curative properties of the water, and the healthful surroundings of Hot Springs, an Army and Navy hospital was established in 1884. The new hospital building, which cares for several hundred officers and enlisted personnel, cost nearly $4,000,000.

NOTE: Hot Springs National Park is shown on the Society's map of the United States. See also, "Arkansas Rolls Up Its Sleeves," in the *National Geographic Magazine* for September, 1946.

WILLARD R. CULVER

A GIRL WITH A THERMOMETER PROVES THAT THE SPRING WATER AT HOT SPRINGS IS HOT

Pribilof Seals Have Repaid Cost of Alaska

THE Pribilofs, rocky, volcanic, Bering Sea islands where a recent census officially reported a population of 490, formed one of Alaska's original "gold mines."

The "gold" consisted of valuable sealskins and other furs. Revenue from the Pribilofs alone has more than repaid the United States the $7,200,000 purchase price of all Alaska, to which the islands are politically attached.

Leased to Private Firms

The Pribilofs' summer fur seal colony (illustration, page 12) numbers well over 2,000,000, and in the past has been estimated at 5,000,000. Indiscriminate killing at sea, including the cows, once reduced the colony to less than 250,000. Now only "bachelors" are taken for their fur.

For the first 20 years of United States ownership, the Pribilofs were leased to a private company for $55,000 a year, with an additional tax of $2.62½ on each sealskin taken. Then the islands were leased for another 20 years at $60,000, plus a tax on each skin of $10.62½.

Since that lease expired the federal government has supervised all sealing operations, with the result that still larger returns have accrued to the United States Treasury. The only private company now interested is the firm that dresses and dyes the fur and annually auctions the pelts at St. Louis, Missouri.

When Gerasim Pribylov, a Russian, reached the islands in 1786, they were uninhabited. He brought in Aleuts from the near-by Aleutian Islands. They were installed in four or five villages to kill, skin, and cure the seals.

Descendants of these Aleuts became wards of the United States government. They were provided with homes, schools, medical and dental care, as well as fuel, food, and clothing. A roster of the islanders reads like a Russian "blue book"—they usually chose their names from among the Russian nobility. During World War II, they were evacuated.

Wind Prevents Growth of Trees

The Aleuts practically hibernate, not so much because of sub-zero cold, but because high winds make it impossible much of the time to stand erect. Snowdrifts shift with the wind, seas break over the cliff walls, and the islands are often bound by ice floes.

There is no fall or spring. Summer brings a variety of wild flowers. There are a dozen species of grasses and basket-making rushes, but there are no trees because of the wind. Cattle cannot be raised profitably for haying is a climatic impossibility. The summer sun seldom shines because thick fogs blanket the islands.

The Pribilof group consists of two main islands, St. Paul and St. George, forty miles apart, and three islets near by. One islet was named for its walruses, whose tusks supplied ivory; another took its name from the otter.

The Aleuts prefer walrus meat to seal, and they cover their fishing boats with walrus hide. The otter's valuable fur resulted in the animal's extermination.

UMI

Though less than four minutes seems like a short time in which to take countless photographs, make a host of measurements, and record innumerable details, still scientists are looking forward to the May 20 eclipse because it will be the longest one for eight years to come.

The eclipse will not be visible in the United States. Partial phases, however, can be witnessed throughout South America except in parts of Venezuela, Colombia, and Ecuador. The phenomenon also will be seen on the Atlantic between South America and Africa and in most of Africa.

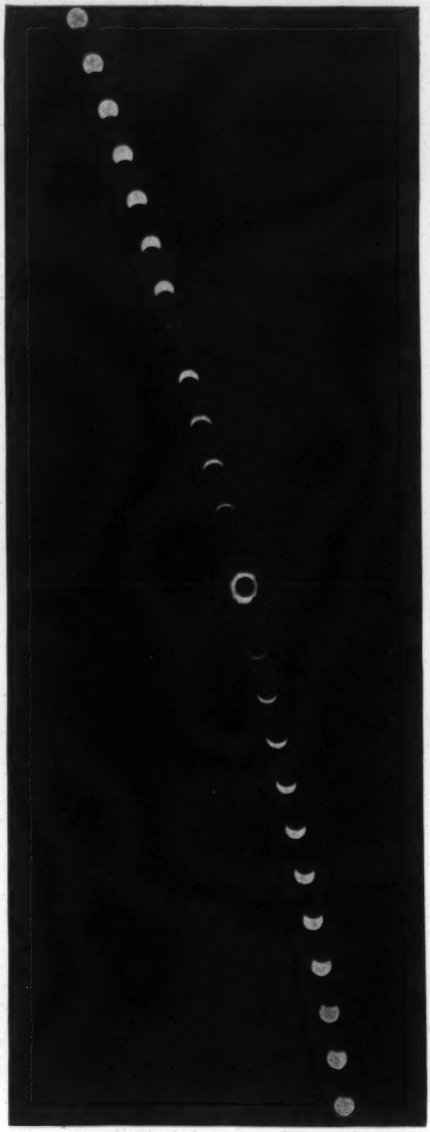
The total phase of the eclipse will start at sunrise southeast of the Juan Fernández Islands off the coast of Chile. The zone of totality crosses the Andes in the region of Mt. Aconcagua, highest peak in South America. Then it moves through northern Argentina, southern Paraguay, and northeastward across the vast interior of Brazil.

At Salvador (Baía), Brazil, the path of totality sweeps across the Atlantic to Liberia. It continues along the south coast of Africa's equatorial bulge and crosses the continent to leave the earth at sunset south of Nairobi, Kenya.

The Brazilian highlands in the states of Minas Geraes and São Paulo provide the best localities for viewing the eclipse. Weather conditions are expected to be generally favorable. The path of totality in that region is more than 100 miles wide. Bocayuva is close to the center of this zone.

NOTE: Bocayuva may be located on the Society's map of South America.

See also, "Eclipse Adventures on a Desert Isle" and "Nature's Most Dramatic Spectacle," in the *National Geographic Magazine* for September, 1937; and "Photographing the Eclipse of 1932 from the Air" and "Observing a Total Eclipse of the Sun," November, 1932.



RICHARD H. STEWART

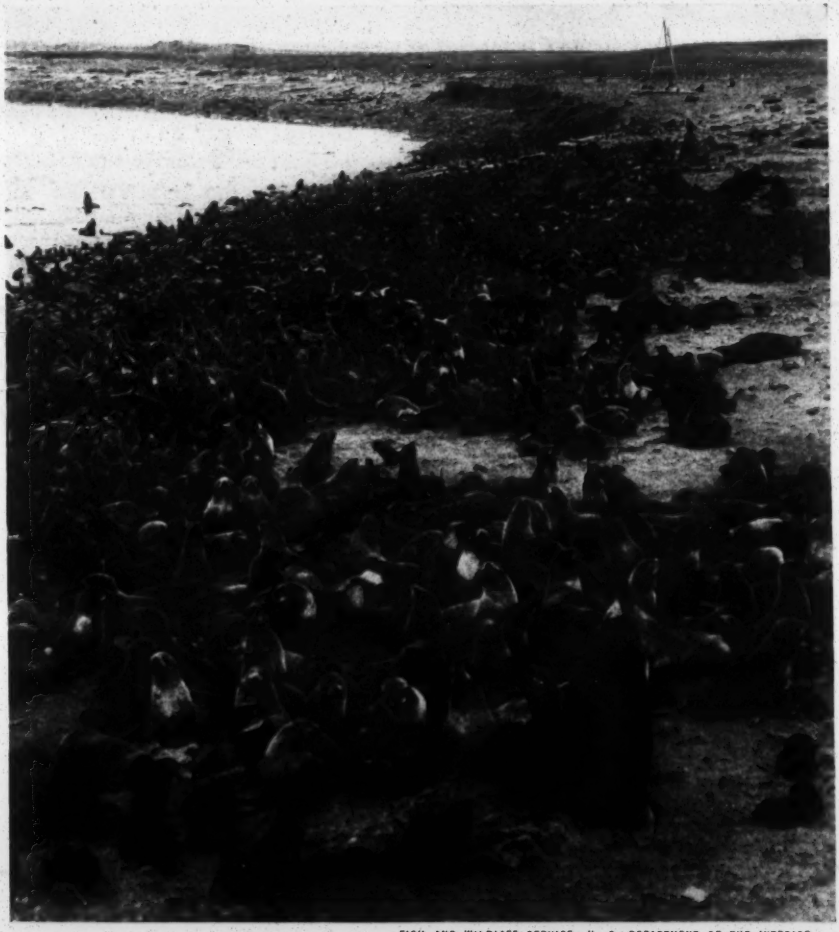
THE CORONA FLAMES AS MOON COVERS SUN

Exposures made every five minutes record the 1937 Canton Island eclipse. The National Geographic Society continues its research in this field as scientists gather in Brazil to observe the May 20 total eclipse.

The islands do a profitable business in fox fur, both blue and white, which is still available in good quantity.

NOTE: The Pribilof Islands may be located on the Society's map of the Pacific Ocean and the Bay of Bengal.

For additional information, see "Strategic Alaska Looks Ahead," in the *National Geographic Magazine* for September, 1942; and "The Sealing Saga of Newfoundland," July, 1929.



FISH AND WILDLIFE SERVICE, U. S. DEPARTMENT OF THE INTERIOR

FUR SEALS SUMMER ON THE PRIBILOFS, BLEAK BERING SEA ISLANDS

The bulls arrive first and take up stations along the shore. They weigh 400-500 pounds and have dark fur. As the much smaller and lighter-colored cows arrive, each bull collects about 30 as his "harem," the unit of family life on the Pribilof rookeries. The cows give birth to their single pups (foreground, dark in color) within a few hours after arriving. The pups learn to swim before cold weather comes, when they go off with their mothers to warmer waters for the winter. Males reach maturity in seven years, females in three. Only half-grown bulls, are taken for their pelts.

A NUMBER OF SEPARATE COLOR PICTURES from the *National Geographic Magazine* may be obtained from the National Geographic Society for educational use. The pictures are available in packets of 48 sheets and 96 sheets at 30¢ and 50¢ a packet respectively. Write for subject list and order blank.